

ADVANCES IN ENDOSCOPY

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Techniques for Performing ERCP in Roux-en-Y Gastric Bypass Patients



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G&H Could you discuss the surgically altered anatomy that results from weight-loss surgery?

ASR The anatomic rearrangements involved in Roux-en-Y gastric bypass and duodenal switch procedures are the most important, as these rearrangements pose the largest challenges to endoscopists, particularly when performing endoscopic retrograde cholangiopancreatography (ERCP). Roux-en-Y gastric bypass typically involves the creation of a small pouch from the existing stomach and the partitioning of the remainder of the stomach to completely exclude it from the passage of food. The pouch is connected to a Roux-en-Y limb (a limb of the small intestine that is usually approximately 1 m long, although it may occasionally be longer). The Roux limb is then reconnected to the small intestine approximately 1 m downstream at the jejunojejunostomy. There are typically 2 limbs of the anastomosis: the efferent limb, which carries luminal contents further down the gastrointestinal tract, and the pancreaticobiliary limb, which brings down juices from the bile and pancreatic ducts into the rearranged gastrointestinal tract. Endoscopists need to obtain access to the pancreaticobiliary limb in order to perform ERCP in these patients.

Duodenal switch is an older, riskier operation that is performed with less frequency than Roux-en-Y gastric bypass surgery and is typically reserved for super-obese patients. In this operation, the second portion of the duodenum is completely closed off, and a loop of the ileum is anastomosed to the duodenum. Therefore, almost all of the food bypasses a large portion of the small intestine, resulting in radical weight loss. The

2 limbs of the small intestine are then rejoined approximately 100 cm proximal to the ileocecal valve. Performing ERCP in patients following duodenal switch via a purely endoscopic approach is extremely difficult, if not impossible.

G&H What specific challenges are faced by endoscopists attempting to perform ERCP in Roux-en-Y gastric bypass patients?

ASR The challenges in these patients are 3-fold. One challenge involves the altered anatomy in terms of reaching the major papilla. Although better endoscopes and enteroscopes have recently become available, the distance involved is a significant challenge. The second challenge involves orientation. Endoscopists use front-viewing scopes; however, the papilla is usually in an upside-down configuration, which is the opposite of what endoscopists are used to. Because these scopes often do not have elevators, scope positioning must be precise in order to maneuver the instruments in the correct orientation. The third challenge involves the instruments. The currently available instruments that were actually designed for the long endoscopes required for performing ERCP in these patients are very few and extremely limiting.

These challenges are becoming more and more pertinent due to the current obesity epidemic. In addition, 2 recent papers from *The New England Journal of Medicine* showed that bariatric surgery has a very beneficial effect on diabetes in obese patients, which means that bariatric surgery will be performed more and more frequently, at least until the development

of a less invasive method of managing obesity. Thus, gastroenterologists will be faced with the challenge of performing ERCP in an increasing number of patients with surgically altered anatomy.

G&H What techniques are used for performing ERCP in these patients?

ASR ERCP can be performed in these patients with surgical (open or laparoscopic) assistance or using an enteroscopy-based approach. Surgery-assisted ERCP is performed in the operating room. The surgeon identifies the excluded portion of the stomach, which is brought to the skin using either a rigid sigmoidoscope or laparoscopic trocar, through which a standard side-viewing duodenoscope is advanced into the excluded stomach and then down into the papilla. Standard ERCP is then performed.

Enteroscopy-assisted ERCP is typically performed using a single-balloon or double-balloon enteroscope through the mouth, down the pouch, through the Roux limb to the jejunojejunostomy, and then up the pancreaticobiliary limb, where the papilla is identified in an upside-down configuration.

G&H What are the advantages and disadvantages of these techniques?

ASR The main advantage of balloon enteroscopy-assisted ERCP is that it avoids the potential complications of surgery. The disadvantages of this technique are its very long procedural time and its inadequate instruments. In addition, the success rate for completing balloon enteroscopy-assisted ERCP is approximately 60% in most of the literature, which is lower than the success rate of surgery-assisted ERCP.

Advantages of surgery-assisted ERCP include the use of standard endoscopes and instruments and the avoidance of an upside-down configuration (which is encountered in enteroscopy-assisted ERCP). In addition, in surgery-assisted ERCP, the endoscopist can reach the papilla only minutes after the surgeon obtains access to the excluded portion of the stomach. The disadvantages of surgery-assisted ERCP are that it involves surgery and that it may take a long time for the surgeon to identify the gastric remnant because of the previous surgery in these patients.

G&H How difficult are these techniques to perform?

ASR Enteroscopy-assisted ERCP is a technically challenging procedure and, thus, requires a high skill level.

Surgery-assisted ERCP requires only standard ERCP skills and experience because it uses a standard endoscope, although this technique requires a surgeon who is experienced in gaining access to the excluded stomach.

G&H What have studies reported thus far regarding these techniques?

ASR My colleagues and I recently published the results of a retrospective review of these techniques. There have been a few previous abstracts, older papers, and case series on these techniques, but they mainly focused on only 1 of the techniques; our study was the first to directly compare the 2 approaches. In our study, we included all of the patients in our medical center with Roux-en-Y gastric bypass anatomy who had undergone an ERCP using either the balloon enteroscopy-assisted or laparoscopy-assisted approach. The therapeutic success rates (ie, the ability to cannulate the papilla and perform the intended intervention) of the laparoscopy-assisted and balloon enteroscopy-assisted approaches were 100% and 59%, respectively. Due to the need for an operating room, laparoscopy-assisted ERCP was more expensive than balloon enteroscopy-assisted ERCP when all patients were included in the analysis. There was no difference in complications or length of stay between the 2 techniques.

We also examined the factors associated with success in balloon enteroscopy-assisted ERCP. In patients with a Roux plus pancreaticobiliary limb length less than 150 cm, balloon enteroscopy-assisted ERCP had a success rate of over 85%.

In addition, we conducted a cost analysis to determine which of these techniques should be performed first. The answer came down to the length of the Roux plus pancreaticobiliary limb. If a patient had a Roux plus pancreaticobiliary limb length of less than 150 cm, even performing a failed balloon enteroscopy-assisted ERCP followed by a successful laparoscopy-assisted ERCP was more cost-effective than performing a laparoscopy-assisted ERCP as the initial approach. On the other hand, in patients with a total Roux plus pancreaticobiliary limb length over 150 cm, not only was the success rate higher with laparoscopy-assisted ERCP, this approach was less costly to perform first.

G&H What were the limitations of this study?

ASR Our study was a single-center experience of a referral center for ERCP, so the study results may not be generalizable to the community at large. In addition, our study participants were a defined population (as opposed to a heterogeneous population) and were not randomized due to the study's retrospective nature.

G&H What were the recommendations arising from this study?

ASR The study results provide a guideline for practicing gastroenterologists trying to determine which approach to use first when performing ERCP in a patient with anatomy that has been altered by Roux-en-Y gastric bypass surgery. From my perspective, the biggest take-home message is that the operative report is crucial—particularly in centers where both of these techniques are available—as it provides information regarding surgical complications and the anatomy of these patients. This information will help gastroenterologists direct patients down the appropriate pathway when performing ERCP.

G&H What are the next steps in research in this area?

ASR The next steps are to further evaluate different approaches, scopes, and instruments, including any proto-

types that become available, that may work better with the long enteroscopes required for these procedures. It would be ideal to have a device that could be used through a standard duodenoscope to help endoscopists gain access to the papilla in patients who have undergone Roux-en-Y gastric bypass surgery. This development would reduce the need for both surgery and new accessories.

Suggested Reading

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